

CLAIMS

WHAT IS CLAIMED IS:

1. A method of facilitating power transfer between a main engine and an auxiliary power unit (APU), comprising:
 - obtaining a main engine generator frequency;
 - determining a target APU speed that will generate an APU generator frequency that is the same as the main engine generator frequency;
 - adjusting an actual APU speed to the target APU speed; and
 - conducting the power transfer between the main engine and the APU.
2. The method of claim 1, wherein the step of determining the target APU speed comprises checking a look-up table linking a plurality of APU frequencies with a plurality of corresponding target APU speeds.
3. The method of claim 1, further comprising determining an APU rate limit, wherein the step of adjusting the actual APU speed includes keeping an adjustment rate below the APU rate limit.
4. The method of claim 3, wherein the APU rate limit is determined based on at least one fuel schedule.
5. The method of claim 1, further comprising:
 - determining a maximum APU load; and
 - adjusting an aircraft electrical load requirement until the aircraft electrical load falls below the maximum APU load.

6. The method of claim 5, wherein the load on the main engine comprises a plurality of load devices, and wherein the adjusting step comprises selecting at least one load device for shut-down during the power transfer.

7. The method of claim 5, wherein the step of determining the maximum APU load comprises checking a look-up table linking the target APU speed with at least one main engine operating parameter.

8. The method of claim 1, wherein the step of conducting power transfer comprises connecting the main engine and the APU to a communication bus.

9. An engine control system that facilitates power transfer between a main engine and an auxiliary power unit, comprising:

a control unit in communication with an aircraft load management system;

an APU controller in communication with the APU; and

a communication bus that forms a communication link between the control unit and the APU controller,

wherein the APU controller obtains a main engine generator frequency from the control unit, determines a target APU speed that will generate an APU generator frequency that is the same as the main engine generator frequency, and adjusts an actual APU speed to the target APU speed to allow power transfer between the main engine and the APU.

10. The engine control system of claim 9, wherein at least one load is connected to the main engine, wherein the APU controller determines a maximum APU load and wherein the control unit selects at least one load device for the aircraft load management system to shut down during the power transfer.

11. The engine control system of claim 9, wherein the APU controller obtains the target APU speed by checking a look-up table linking a plurality of APU generator frequencies with a plurality of corresponding target APU speeds.

12. The engine control system of claim 9, wherein the APU controller determines an APU rate limit and adjusts the actual APU speed at an adjustment rate below the APU rate limit.

13. The engine control system of claim 12, wherein the APU controller determines the maximum APU load by checking a look-up table linking the target APU speed with at least one main engine operating parameter.